



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,636	06/21/2001	Arihiro Takeda	0941.65640	6148

7590 12/14/2004  
Patrick G. Burns, Esq.  
GREER, BURNS & CRAIN, LTD.  
Suite 2500  
300 South Wacker Dr.  
Chicago, IL 60606

EXAMINER
----------

AKKAPEDDI, PRASAD R

ART UNIT	PAPER NUMBER
----------	--------------

2871

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b> 09/886,636	<b>Applicant(s)</b> TAKEDA ET AL.	
	<b>Examiner</b> Prasad R Akkapeddi	<b>Art Unit</b> 2871	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 September 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-16 and 18-27 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,9-16 and 18-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of species A in the reply filed on 09/21/2004 is acknowledged. The traversal is on the ground(s) that examination of all species would not place an undue burden on the examiner and that the independent claims have several features in common and a search for one species would likely overlap with a search for the other. This is not found persuasive because: though the independent claims have several features in common, but the addition of horizontal alignment layer on each of the substrates as recited in the independent claim 7, will result in a separate and distinct invention from that recited in the independent claim 1.

The requirement is still deemed proper and is therefore made FINAL.

### *Response to Amendment*

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 5, 18, 20, 21 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Konovalov et al. (Konovalov) (SID, Society of Information Display, May 17-22, 1998, P.1127).

As to claim 1: Konovalov discloses a liquid crystal display device with a pair of substrates having electrodes, a liquid crystal layer sealed between the substrates (Fig. 1). Konovalov also discloses an insulating layer having a plurality of patterns with a dielectric constant different from the dielectric constant of the surrounding area (page 1128, col. 2, lines 31-33) and the variation of the electric field orientation in a pixel region (Fig. 1) (Page 1127, col. 1, last paragraph).

Konovalov teaches the use of liquid crystal possessing negative dielectric anisotropy (see introduction) and a pair of polarizers (Fig. 2 description). In addition Konovalov teaches that the liquid crystal molecules in a tilted state when a voltage is applied across the electrodes (Fig. 1).

As to the limitation 'controlling an in-plane direction of the liquid crystal molecules when a voltage is applied across the electrodes', Konovalov teaches in (page 1, col. 2, lines 1-8) that the dielectric ribs deposited across the electrode area is different from the longitudinal component of the dielectric susceptibility of the liquid crystal and due to this, after applying electric field to the opposite electrodes the component of the field parallel to the electrodes arises. This component governs the direction of the molecular inclination under electric field. Since the field is parallel to the electrodes, it is an 'in-plane field' and thus controls the in-plane direction of the liquid crystal molecules.

In Fig. 5 and in the description of the figure under 'electrooptic parameters' on page 3, Konovalov goes into extensive detail of how the liquid crystal molecules undergo transition to tilted state (single domain and 4-domain VA modes) with the application of various voltages ranging from 2V to 3.8v. Hence these teachings of Konovalov are directly applicable to the newly added recited limitation in claim 1.

In response to the functional limitation recited in claim 1, i.e., "said liquid crystal layer including a first region in which liquid crystal molecules of said liquid crystal layer undergo transition to said tilted state upon application of a first voltage across said electrodes and a second region in which said liquid crystal molecules undergo transition to said tilted state upon application of a second voltage larger than said first voltage in magnitude across said electrodes", the functional use of the claimed invention must result in a structural difference

between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the functional use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Examiner would like quote the following from the MPEP:

III. < A REJECTION UNDER 35 U.S.C. 102/103 CAN BE MADE WHEN THE PRIOR ART PRODUCT SEEMS TO BE IDENTICAL EXCEPT THAT THE PRIOR ART IS SILENT AS TO AN INHERENT CHARACTERISTIC

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." *In re Best*, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.

As to claim 4: Konovalov discloses the formation of a photoresist on the substrates (page 1128, col. 2, lines 29-31) and patterning the photoresist layer to form the staggered state as shown in Fig. 1.

As to claim 5: Konovalov discloses a vertical alignment layer (page 1128, col. 2, line 34) and that the liquid crystal is a nematic liquid crystal with a negative dielectric constant (page 1127, col. 2, line 11).

As to claims 18 and 20: Konovalov discloses patterned and the independent nature of the insulating layer (photoresist layer).

As to claim 21 and 27: Konovalov discloses electrodes in the absence of slits and the substrates are transparent (due to the absence of any reflector in the bottom substrate in Fig. 1).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 6, 9-16, 19 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konovalov in view of Hisatake et al. (Hisatake) (U.S. Patent No. 5,434,690).

As to claims 3: Although Konovalov discloses the formation of a photoresist layer and patterning it to form the insulating patterns, Konovalov does not explicitly disclose that the insulating patterns are connected with each other by an insulating film and that the thickness of the insulating patterns is different from the thickness of the insulating layer.

Hisatake in disclosing a liquid crystal display discloses insulating patterns (22) on the two substrates that are connected with each other by an insulating film (17) and the thickness of the insulating patterns different from the insulating film (Fig. 30). Please note the electric field patterns as shown in Fig. 30 that are similar to Konovalov.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

As to claims 6, 9-15: Konovalov does not explicitly disclose the electrode thickness, or the insulating layer being formed on only one substrate, or the positive dielectric constant of the liquid crystal, or the rubbing, or the electrical resistances and impedances, or the metal electrode, or the striped and zigzag nature of the insulating layer.

Hisatake discloses the insulating layer on only one substrate (Fig. 31A), the electrode is narrower than the insulating layer, a nematic liquid crystal with a positive dielectric constant (col. 5, lines 55-57), rubbing treatment of the alignment layers (col.10, lines 41-44), the insulating layer is made from either RTZ-206 or RTZ-606 (col. 27, lines 1-63) having a refractive index of 1.9 and the liquid crystal material is ZLI-3926 with an added chiral agent (S-811) (col. 23,



lines 26-31). Since the two materials are different, the electrical resistance and the impedance of the two materials will also be different as recited in instant claims 9 and 12. Hisatake also discloses the connection of the insulating patterns with an insulating film (Fig. 30), conductive electrodes, the alignment layers (15 and 16) having a different thickness than the insulating layers (17 and 18) (Figs. 18, 30, 31A), plurality of stripes and the zigzag nature of the stripes (Figs. 25A and 25B), as recited in instant claims 13-15.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

As to claim 16: Konovalov discloses the plurality of insulating layers are independent of one another (Fig. 1).

As to claims 19, and 22-26: Konovalov does not disclose the slits in the insulating layer, nor the insulating layer provided on only one of the electrodes.

Hisatake discloses the slits in the insulating layer (Figs. 25-26), the arrangement with respect to the pixel area (col. 5, lines 23-40), insulating layer on the both the electrodes (Fig. 30), patterned nature of the insulating layer on the electrodes (figs. 1 and 30).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the insulating patterns and the film disclosed by Hisatake to the device of Konovalov for providing a display that is capable of widening the angle of viewing field and to enhance the transmittance and increase the response speed while being driven at low driving voltages (col. 3, lines 36-43).

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (a) Song et al. (U.S. Patent No. 6,657,695) and (b) Ikeda et al. (U.S. Patent No. 6,671,025).

### ***Response to Arguments***

6. Applicant's argument No. 1 (Page 8, lines 12-13 and page 9, lines 16-17 of Remarks submitted on 06/01/2004): Applicant argues extensively that the cited prior art does not disclose or suggest the claimed invention in claim 1, i.e., "the width of the insulating patterns are set to be larger than the width of the gap between the insulating patterns".

Examiner's response to argument No. 1: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the width of the insulating patterns are set to be larger than the width of the gap between the insulating patterns.) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification,

limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

7. Applicant's argument No. 2 (page 10, lines 6-9): Hisatake does not teach using polarizers at both outer sides of the glass substrates, as now recited in amended claim 1. Accordingly, Applicants believe that one skilled in the art would not be motivated to combine the teaching of Hisatake with Konovalov, as suggested by the Examiner.

Examiner's response to argument No. 2: In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Konovalov's teachings and Hisatka's teachings are directed to widening the viewing field angle, response, speed and brightness of a liquid crystal display as previously pointed out in the motivation to combine the references. Hence, one skilled in the art would be motivated to combine the teachings of Hisatake and Konovalov, as previously suggested by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 571-272-2285. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

Art Unit: 2871

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PRA

\*\*\*

Prasad R Akkapeddi, Ph.D  
Examiner  
Art Unit 2871

  
TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER